

**Amendments to the Specification:**

Please replace the paragraph beginning at page 14, line 8, with the following rewritten paragraph:

The integrated on-chip combination reaction, separation and detection microsystem may include a multiplicity of CE separation channels or fluid conduits, which may permit simultaneous detection of different analytes in a common sample, detection of the same analyte in multiple different samples, or any combination thereof. In the case of detection of different analytes in a common sample, it is contemplated that a sample inlet port may be connected to one or more sample reservoirs, with any number of separation channels or fluid conduits in fluid connection with such reservoir or reservoirs. In one embodiment, the separation channels or fluid conduits are arranged in a star-burst configuration, with a multiplicity of separation channels or fluid conduits emanating from and in fluid connection with a common central sample reservoir, which in turn is in fluid connection with an inlet port. It is also possible and contemplated that the multiplicity of separation channels or fluid conduits are in fluid communication with one or more reagent reservoirs, running buffer reservoirs and the like, such that different reagents, buffers or the like may be selected for different separation channels or fluid conduits.

Please replace the paragraph beginning at page 15, line 24, with the following rewritten paragraph:

The separation channels or fluid conduits are in fluid connection with the thick-film electrochemical detector component forming a part of the integrated on-chip combination reaction, separation and detection microsystem. In one embodiment, a channel outlet from the separation channel or fluid conduit is in fluid connection with the surface of a thick-film working electrode, such as a screen-printed carbon-based working electrode. The distance between the channel outlet and the electrode surface may be modified as required for the analyte, separation technique and electrochemical detection technique, but in general such distance will be between about 1  $\mu\text{m}$  and about 500  $\mu\text{m}$ , and preferably

between about 50  $\mu\text{m}$  and 100  $\mu\text{m}$ . The distance may be ~~controller~~ controlled by a thin-layer spacer of suitable thickness.

Please replace the paragraph beginning at page 21, line 19, with the following rewritten paragraph:

**FIG. 2** ~~is~~ is a schematic of an integrated reactor and separation microchip with electrochemical thick-film detection. In **FIG. 2**, **S** is the sample reservoir, **R** is the reagent reservoir, **RB** is the running buffer reservoir, **B** is the buffer reservoir, **RC** is the reaction channel and **D** is the detector, a thick-film working electrode. Electrodes for electrokinetic movement of fluids, or other fluid transfer components, are not shown. The reaction chamber, 200  $\mu\text{m}$  wide and 3.6 mm long, is connected through 50  $\mu\text{m}$  wide channels to the reagent and sample reservoirs at one side, and to a four-way injection cross at the other side. The separation channel is 74 mm long and 50  $\mu\text{m}$  wide.

Please replace the paragraph beginning at page 22, line 3, with the following rewritten paragraph:

**FIG. 34** is an embodiment in which the separation component **120** is parallel to the detection component **140**. Separation component **120** includes reservoirs **122**, **124** and **126**, which may be sample, buffer or reactant reservoirs, with reservoirs **122** and **126** connected by channel **128**. The channel **130** is a separation channel, terminating in outlet **132**. Separation component **120** is in contact with, and optionally detachable from, detection component **140**, such that the outlet **142** is between about 1  $\mu\text{m}$  and 500  $\mu\text{m}$ , and preferably between about 50  $\mu\text{m}$  and 100  $\mu\text{m}$ , from the thick-film working electrode ~~142~~ **132**. An insulating layer **144** covers that portion of the screen-printed working electrode not in fluid contact with outlet **142**, with a connector **146** for electrical contact. This embodiment may also include a waste or detector reservoir, electrokinetic electrodes, reference electrodes and other features shown on **FIG. 1**.